SPECIMEN NATIONAL PLAN FOR IMPLEMENTATION OF REDUCED VERTICAL SEPARATION MINIMA

(State name)

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1. RVSM BACKGROUND

In the late 1970s, the International Civil Aviation Organization (ICAO) initiated a comprehensive program of studies to examine the feasibility of reducing the 2000 ft vertical separation minimum (VSM) applied above flight level (FL) 290 to the 1000 ft VSM as used below FL 290. Throughout the 1980s, various studies were conducted under the auspices of ICAO in Canada, Europe, Japan and the United States.

The studies demonstrated that the global reduction of vertical separation was safe, feasible and without the imposition of unduly demanding technical requirements and would be cost-beneficial. The studies also showed that the North Atlantic (NAT) minimum navigation performance specification (MNPS) airspace was an ideal area for the introduction of a reduced vertical separation minimum (RVSM) because of the types of aircraft and the essentially unidirectional tidal flow of traffic. Planning for RVSM in the NAT Region commenced in 1990. The first stage of the Operational Evaluation phase, using the 1000 ft RVSM (between FL 330 and FL 370 inclusive), began in March 1997. A second stage extended RVSM to between FL 310 and FL 390 inclusive in October 1998.

NAT Region implementation involves the application of RVSM in the transition area of States within the European Region. In an early stage of the studies, it was determined that the introduction of RVSM in upper European airspace would have considerable benefits. However, from the outset, it was clear that the complex nature of the European air traffic services (ATS) route structure, its wide variety of aircraft types and high traffic density, as well as the high percentage of aircraft climbing and descending, would be a more demanding environment than the NAT Region. Therefore, the introduction of RVSM in the European environment addressed all aspects of en-route operations such as the safety implications of European traffic complexity, the mix of aircraft types, the many stakeholders involved (39 RVSM participating States, industry, aircraft operators), etc.

AFI RVSM BACKGROUND

Pursuant to APIRG/13 Decision 13/58 which *inter alia* stated that:

DECISION 13/38 ESTABLISHMENT OF A TASK FORCE ON RVSM AND RNAV/RNP IMPLEMENTATION

THAT AN APIRG TASK FORCE DEDICATED TO RVSM AND RNAV/RNP IMPLEMENTATION BE ESTABLISHED, WITH THE FOLLOWING TERMS OF REFERENCE, WORK PROGRAMME AND COMPOSITON:

Terms of Reference of the ICAO RVSM/RNAV/RNP Implementation Task Force

The RVSM/RNAV/RNP Task Force was established within the framework of the ATS/AIS/SAR Sub-Group in order to explore ways and means for the implementation of RVSM/RNAV/RNP in the AFI Region.

Terms of Reference of RVSM and RNAV/RNP Task Force

a) To develop a comprehensive implementation plan for RVSM, RNAV and RNP in the AFI Region, taking into account the requirements contained in the ICAO Doc.9574, Doc.9613, Doc.9689, Doc.4444 and other relevant reference documents.

b) To identify any areas within the AFI Region where it may be feasible to introduce RVSM and RNAV/RNP in the initial implementation.

c) To determine the extent to which a cost/benefit analysis is required prior to implementation of RVSM and RNAV/RNP.

d) To coordinate with the bodies responsible for the implementation of RVSM and RNAV/RNP in adjacent regions in order to harmonize implementation plans.

e) To develop guidance material for RVSM and RNAV/RNP implementation in the AFI Region, including taking due account of experience gained in the SAT Region and existing material developed by other ICAO Regions (EUR, NAT, ASIA/PAC, etc.).

f) To address any other matters, as appropriate, which are relevant to the implementation of RVSM and RNAV/RNP.

1.1 Planning for RVSM Implementation

Planning for implementation within the Africa-Indian Ocean (AFI) Region, the AFI Planning and Implementation Regional Group (APIRG) must ensure that:

- safety objectives will be met;
- the operational acceptability and feasibility of RVSM in AFI airspace is feasible and operationally acceptable; and
- a positive cost/benefit ratio can be demonstrated for the stakeholders.

2. RVSM PLAN

2.1 General.

An AFI RVSM Plan will introduce the AFI Reduced Vertical Separation Minimum (RVSM) Program, its contents and challenges, and describe how it will be organized and managed by the numerous stakeholders. The AFI RVSM will provide six additional flight levels between FL 290 and FL 410 inclusive in the airspace of 53 RVSM States. This will result in additional airspace capacity, reduction in flight delays and fuel economies for the users.

As required in other regions, AFI RVSM will have to demonstrate that the target level of safety (TLS) set out by ICAO for the vertical collision risk will not be exceeded in the AFI RVSM airspace. To this end, an AFI RVSM Implementation Safety Case will be developed. The three main deliverables to be included in this effort are the functional risk assessment (FRA), the collision risk assessment (CRA) and the national safety plans.

A RVSM Implementation plan is also required for each State. A National RVSM Plan should set out the scope of the work needed to safely implement RVSM at the earliest realistic date and in an efficient manner. The application of a reduced vertical separation minimum by the States and ATS providers requires completion of a wide-ranging and coordinated array of activities by the various stakeholders in the AFI RVSM States, as well as by the airspace users. These activities must be identified to enable RVSM operations to be conducted in a safe and efficient manner. National RVSM Plans must therefore be developed in consultation with the AFI RVSM Program Office (ARPO), service providers, airspace users and other relevant stakeholders.

2.2 Purpose

The purpose of the National RVSM Plan is to identify the essential elements that need to be addressed in order for the ICAO RVSM concept to be adopted in the AFI Region. The plan should present the actions that need to be taken to ensure that all safety and operational criteria are met prior to implementation.

2.3 Scope

Numerous tasks to be accomplished from a wide range of stakeholders. This plan will serve as the basis for managing stakeholder activities and will form part of the AFI RVSM Plan to ensure a common timescale. The plan should encompass:

- all key activities, including tasks for the AFI RVSM Program Office, States, airspace users and manufacturers;
- an overview of RVSM Program tasks;
- key milestone dates and associated timescales of required activities;
- assumptions on which the RVSM Program and its activities and timescales have been based; and

- the National RVSM program structure and management, allowing effective cooperation between all participants involved.

Note: A draft schedule is attached as Appendix A.

2.4 Objectives

The objectives of the National RVSM Plan are to:

- identify all key activities, milestones and deliverables;
- establish realistic timescales;
- identify roles and responsibilities;
- reflect the commitment of individual States;
- form part of the AFI RVSM Program; and
- serve as the basis for national RVSM program plans.

2.5 RVSM Plan and Program Application

An AFI RVSM Program Office (ARPO) was established to effectively manage the Regional RVSM Program in consideration of the many stakeholders and the interdependence of their tasks.

A National RVSM Management Committee would be required to direct the establishment of an RVSM Program and Plan. This should be accomplished in consultation with AFI RVSM Program Office, airspace users and other relevant RVSM stakeholders. The National Program Managers and all other stakeholders will form an integral part of the AFI RVSM Implementation Program. The identification and resolution of any issue that may affect the overall RVSM Program will need to be a cooperative effort, with the RVSM Master Plan as a common basis for all States. The program should:

- provide for the safe operational introduction of RVSM at the earliest possible date;
- combine tasks with realistic timescales; and
- enable full commitment on the part of all RVSM stakeholders to the program.

Development of the National RVSM Plan, through consultation with stakeholders corresponding, and the detailed work schedule should be submitted for approval by the relevant State authority. Once approved, the National RVSM Master Plan should be used as the framework for the organization, management and implementation of the National RVSM Program. The RVSM Plan will be used to meet the agreed common target dates, major milestones and assess progress by all national stakeholders.

National Program Managers will report progress to the AFRI RVSM Program Office for inclusion in the AFI RVSM master schedule. The Program Manager must identify potential delays to the National RVSM master schedule, take necessary actions to address the relevant issues and find potential solutions.

3. NATIONAL RVSM PROGRAM

The RVSM Program is large and complex, with many interdependent stakeholder activities. If the program is to succeed and attain the agreed implementation date of January 2005, it will require full cooperation and the commitment and coordination of the numerous stakeholders. Identified stakeholder activities must be developed into a Work Program. This Work Program can be summarized into five sub-programs. *See Appendix B*.

3.1 Sub-Program 1 - RVSM Program Management.

The main deliverable is the RVSM Plan for which full Stakeholder commitment is required to meet the agreed RVSM implementation date. RVSM Implementation includes program management activities throughout the required period, especially progress monitoring and progress/status reports to the ARPO.

3.1.1 National RVSM Plan

The main deliverable to be developed in consultation with relevant Stakeholders is a National RVSM Plan with realistic time scales.

3.1.2 RVSM Implementation Program Management Plan

States should develop a National RVSM Implementation Program Management Plan and processes to enable effective and proactive management of the RVSM Program. National Programme Managers (NPMs) should manage the national RVSM Program throughout the required period and provide informative progress/status reports to the ARPO and relevant Stakeholders.

3.1.3 RVSM Promotion

RVSM promotion awareness needs to be undertaken by each State. Increasing the levels of awareness throughout the industry and within each State will reduce the risk of the RVSM Implementation program failing to attain its objectives and gain needed support. National Programme Managers (NPMs) should establish information methods and links with all RVSM affected Stakeholders in order to provide support to the RVSM Program via advance information and collaborative actions.

3.2 Sub-Program 2 - Aircraft Operations and Airworthiness

To ensure timely RVSM approvals for Aircraft Operations and Airworthiness by States all technical, operational and regulatory directives must be available for airspace users. The availability of such directives will also assist the monitor and approval process. Aircraft height-keeping accuracy must be verified through the operation of a height-monitoring infrastructure system. The monitoring program will provide the technical data to confirm that safety objectives are met.

3.2.1 Flight Crew Procedures

In order to support safe operations in AFI RVSM airspace, appropriate flight crew procedures need to be available and flight crew training needs to include these RVSM specific procedures. Flight crew procedures should allow flight crews to comply with the normal, abnormal and contingency AFI RVSM operational procedures. The assurance that the aircraft equipment meets the RVSM minimum aircraft system performance specification (MASPS) requirements for operation in AFI RVSM airspace could be included in these procedures. The AFI RVSM Program Office should ensure that AFI RVSM procedures are not different from those of other regions.

3.2.2 Aircraft Requirements

For operations in RVSM airspace, flights are required to be RVSM-approved. Military authorities should be encouraged to make their transport fleet compatible with RVSM requirements. To obtain RVSM approval, aircraft may need modifications based on service bulletins produced by aircraft manufacturers. Joint Aviation Authority (JAA) Temporary Guidance Leaflet No.6 (TGL 6) provides MASPS, guidance on airworthiness and operational practices and procedures for RVSM airspace that can be used as bases for the approval processes. The RVSM requirements must also be reflected in ICAO's Doc 7030 (*Regional Supplementary Procedures*) as a basis for national regulation.

3.3 Sub-Program 3 – Air Traffic Management (ATM)

This sub-program will ensure that all ATS provider units are well prepared and ready for the introduction of RVSM on the agreed date. Tasks should be identified to allow States to restructure airspace, introduce RVSM Procedures, modify ATC systems, provide ATC Training and resolve legislative issues, etc.

3.3.1 Airspace

The definition of the National RVSM area should be based on the operational requirement for ~~a~~ homogeneous routing areas and major international traffic flows with no significant gaps in it. Additionally, considering its significant benefits, the RVSM should be implemented in an area as wide as possible.

Within RVSM airspace, sectorization and ATS routes will need to be reviewed in the context of the availability of the additional RVSM flight levels. These aspects need separate attention in airspace where the transition to and from non-RVSM airspace will be accommodated.

3.3.2 ATC Procedures

Air traffic control (ATC) operational procedures for the National RVSM airspace will need to be developed and implemented, including:

- flight planning procedures;
- contingency procedures;
- transition procedures; and
- procedures for handling non-RVSM State aircraft.

These procedures must be reflected in the individual State ATC manuals for reduced vertical separation minima and in an amendment to ICAO's Doc 7030 (*Regional Supplementary Procedures*).

3.3.3 ATC Systems

In order to accommodate and support the provision of ATC in an RVSM environment, ATC systems may need to be modified. The modifications are related to the need for the controller to distinguish between RVSM-approved aircraft and -non-approved aircraft, and to accommodate the extra RVSM flight levels and possible re-sectorization. ATC training simulators will require similar modifications.

3.3.4 ATC Training

Specific ATC procedures will be used to facilitate the safe transition of aircraft to/from RVSM and non-RVSM airspace while operating in the RVSM airspace. The transition tasks must be accomplished within the designated RVSM airspace in order to make RVSM operations transparent to adjacent non-RVSM regions. The RVSM Program will also require that specific training of ATC staff be performed prior to the start of RVSM operations. Furthermore, the Program will require that ATC equipment and procedures be modified according to specific Program requirements prior to the start of RVSM operations.

ATC training syllabi must therefore be developed to support RVSM ATC training by the ATS providers. In the context of the additional RVSM flight levels, the associated review of sectorization, ATS routes, locally applied flight level allocation systems and letters of agreement will need to be reviewed and amended. Further, the legal aspects associated with RVSM operations will require identification, with possible consequential amendments to national legislation.

3.4 Sub-Program 4 - RVSM Safety Assurance

Each State is responsible for the safe implementation of RVSM in the airspace over which it has jurisdiction. The State NPMs will be responsible for providing assurance through national safety plans that their responsibilities have been met. The ARPO has assumed responsibility of providing guidance to the States on how to develop these national safety plans.

The introduction of RVSM must be achieved in conjunction with a thorough assessment of the safety implications that will result from this change of operation in a State. It is therefore important that clear safety objectives and safety evaluations showing the attainment of these objectives be met before the introduction of RVSM.

A National RVSM safety policy must also be developed taking into account ICAO guidance. The derived safety objectives, after endorsed by the AFI RVSM Program Office, will form the basis for the RVSM Program tasks.

In order to demonstrate that the above objectives are met, appropriate risk estimation methodologies will need to be available, and sufficient operational and technical data will need to be collected to obtain risk estimates with sufficient confidence.

3.5 Sub-Program 5 – Height Monitoring

It is recognized that there is a requirement for monitoring of aircraft height keeping performance as part of RVSM implementation program. The APIRG AFI RVSM Task Force (TF) established an AFI Regional Monitoring Agency (ARMA) in South Africa to monitor aircraft height within the Region. The ARMA will provide Safety Oversight Services in connection with implementation and continued safe use of RVSM within the designated airspace. However, States are required to certify aircraft for RVSM operations and conduct RVSM implementation readiness assessments.

3.6 RVSM Program Schedule

National Program Managers (NPMs) should develop a schedule for all the activities in conjunction with the various stakeholders. This schedule will serve as the benchmark against which the national program progress will be assessed and should contain the following significant items:

- provisional State approval of the Master Plan;
- monitoring infrastructure fully operational;
- sufficient aircraft approved;
- pre-implementation safety assessment;
- implementation or delay decision;

- implementation date;
- initial post implementation safety assessment; and
- final post implementation safety assessment.

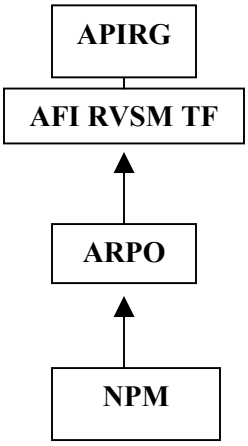
The National Program Managers (NPMs) should:

- review and comment on the program;
- develop their national schedule to interface and conform with the AFI RVSM master schedule; and
- ensure that they can implement RVSM on the agreed date.

Note: See Appendix C

4 RVSM PROGRAM MANAGEMENT STRUCTURE

An AFI RVSM Program Office (ARPO) was established to manage an AFI RVSM Plan. The ARPO will provide guidance to National Program Managers (NPMs) and forward recommendations to AFI RVSM TF for endorsement. The NPMs will coordinate RVSM activities at national level and provide inputs to the ARPO.



4.1 AFI RVSM Program Office (ARPO)

The ARPO will:

- provide strategic guidance to the national RVSM Program Manager;
- ensure continued involvement and commitment of participating States, users and other international organisations to all elements of the RVSM Program;
- where necessary, submit specific proposals for strategic actions to AFI RVSM TF;
- monitor the overall RVSM Program on the basis of progress reports by the RVSM Program Manager and check progress against agreed milestones and propose necessary corrective actions;
- provide detailed and in-depth analyses of the RVSM Program progress;

- submit progress reports to AFI RVSM TF; and
- provide guidance to the States on how to develop national safety plans.

4.2 National RVSM Program Manager

A National RVSM Program Office similar the ARPO should be established by individual States to manage an RVSM Plan. However, it is essential that States identify a National Program Manger (NPM) at the earliest possible date and forward the contact details to the ARPO. The NPM will act as the National RVSM Implementation focal point, report to the ARPO and provide guidance to relevant stakeholders at National level. *See Appendix D.*

The RVSM Program Manager will:

- be responsible for the day-to-day management of the RVSM Program;
- be responsible for ensuring adequate coordination with all RVSM Sub-Program Managers;
- submit regular progress reports to the ARPO, focusing on constraints, difficulties and areas that require strategic decisions;
- ensure that the RVSM Program is maintained on schedule and within the overall assigned budget;
- coordinate the required availability of resources with all concerned;
- be responsible to the ARPO for the execution of the applicable national activities within the AFI Program and Plan;
- report, in accordance with a Communication Plan, on progress against the agreed RVSM Program Plan; and
- participate at the relevant RVSM Program Managers Meetings.

5 RVSM Management Processes

5.1 Program Management Plan (PMP)

A detailed National Program Management Plan (PMP) must be developed which will provide a baseline and communication tool against which to monitor the cost, schedule and performance aspects of the RVSM Program. Using the approved RVSM Master Plan and current program management techniques as a basis, the PMP will include the following:

- work break down schedule;
- risk management plan;
- communications management plan; and
- individual State National Plans.

5.2 Communications Management

Communications management is a key program control process that will contribute to the stakeholders achieving the agreed implementation date. Communications management is summarised here but should be fully described in the PMP. RVSM Communications Management will ensure timely and appropriate generation, collection, dissemination and storage of program information.

An AFI RVSM Communications Management Plan will guide the process. It will define who needs what information, when they need it, and how it will be provided to them. Preparation and maintenance of this plan is the responsibility of ARPO but the full support and commitment of the participating States and stakeholders in this process is essential if the RVSM Program is to attain the agreed implementation date.

5.3 Progress Reporting

Progress information will be required by the ARPO from each State's National Program Manager. These progress reports should describe what the program stakeholders have accomplished. This information will be assembled into an overall RVSM progress report for all stakeholders and provide them with a means of measuring progress towards achieving the program objectives.

As the national RVSM activities are critical to the timely success of the program, progress monitoring at the national level is of great importance. In order to achieve a consistent monitoring picture at the program level, it is important that all States provide accurate and timely information regarding the achievements of each National RVSM Plan.

6 STAKEHOLDER COMMITMENT TO THE RVSM PROGRAM

Each of the stakeholders has an important role to play. Successfully attaining the agreed implementation date necessitates that stakeholders deliver their elements of the program on time. Therefore, delivering the RVSM Program on the agreed implementation date will require that each stakeholder respect the schedule.

The commitment to the whole program by national representatives will signify commitment to key milestones within the program. The detailed activities leading up to each milestone are to be managed by National Program Managers. Only if stakeholders achieve key activities' dates will the Program as a whole attain the agreed RVSM implementation date.

6.1 Stakeholder Responsibility

Each stakeholder responsibility is reflected in the key activities outlined below.

6.1.1 AFI RVSM Program Office

The AFI RVSM Program Office (ARPO) is responsible for the overall management of the RVSM Program, implementation and infrastructure monitoring operation, as well as for the preparation of the safety assessment.

6.1.2 ICAO

ICAO is responsible for providing guidance and a framework to enable the introduction of national regulations needed to be in place for the introduction of RVSM.

6.1.3 The JAA Temporary Guidance Leaflet (TGL) $N^0$6 and the FAA Interim Guidance 91 – RVSM leaflet (TGL) $N^0$6

The Joint Airworthiness Authority (JAA) Temporary Guidance **leaflet (TGL) $N^0$6** could be used for the approval of aircraft and operations in RVSM airspace at national level. Their websites are: www.faa.gov/ats/ato/rvsm1.htm and www.eur.rvsm.com.

6.1.4 RVSM States

State stakeholders include the national civil aviation authority, certification/ regulation authorities and ATS providers. Together they are responsible for the provision of regulations to enable air traffic controllers to safely handle aircraft flying in RVSM airspace, as well as for approving national users for RVSM operations.

6.1.5 Non-RVSM States

Non-RVSM States are responsible for approving aircraft requiring access to RVSM airspace. In addition, non-RVSM States adjacent to the RVSM area may require airspace changes and procedure amendments to handle transition between RVSM airspace and non-RVSM airspace.

6.1.6 Civil Airspace Users

Users wishing to fly in RVSM airspace must gain RVSM approval in the State where the aircraft is registered. A significant proportion of the aircraft population flying in the Region has to be RVSM approved and monitored before RVSM can be introduced on a Regional basis.

6.1.7 Military Authorities

Although certain military aircraft types may be entitled to exemption from obtaining RVSM approval, military users are urged to modify their transport aircraft to meet RVSM requirements.

6.1.8 Aircraft Manufacturers

A wide variety of aircraft types operate in the AFI RVSM airspace. Aircraft manufacturers and their suppliers will be responsible for the development of new service bulletins and equipment to meet RVSM requirements.

7 ISSUES AFFECTING THE RVSM PROGRAM

7.1 RVSM Program Assumptions

The RVSM Program should be based upon a number of assumptions. These assumptions should be identified and agreed upon at the beginning of program development. Assumptions include items such as the existence of an interface with the airborne collision avoidance system (ACAS), that sufficient resources and expertise will be available, that the introduction of RVSM airspace will take place simultaneously in all RVSM States in a coordinated manner, etc. These assumptions may change during the life of the program. A delay in the monitoring infrastructure completion could result in insufficient data for the safety assessment that, in turn, could also affect the implementation date. If this happens, the National and AFI RVSM Programs and Plans may need to be revised accordingly.

7.2 RVSM Program Dependencies

The RVSM Implementation Program forms a part of the APIRG program. If the timescales of APIRG programs are changed, there may be consequences for the established timescales of the RVSM Program. Key program interdependencies should be identified and monitored to ensure common tracking and the efficient execution of the RVSM Program.

7.3 Program Risk Assessment

A series of RVSM Program risk assessments must be carried out with the cooperation of a large number of stakeholders, to identify the risks and impacts associated with the program.

The most significant RVSM Program risks identified are:

- delay in the national plans of any of the 53 States could significantly affect RVSM implementation;
- insufficient number of aircraft approved for the implement/delay decision will result in delays in the RVSM Program;
- insufficient data available (e.g. delay in monitoring infrastructure completion, late approval of aircraft) to enable assessment of operational and technical aspects of safety objectives;
- insufficient ATC staff trained to handle aircraft flying in RVSM airspace could reduce capacity and increase safety risk;

- national ATC system not modified on time for the agreed implementation date will delay the program; and
- delay to any ACAS programs will result in many aircraft having different versions of ACAS, which could cause problems in the RVSM environment.

8. RVSM PROGRAM COST FORECASTS AND RESOURCES

Following a proposal of the ICAO Review of the General Concept of Separation Panel in the late 1980s, all ICAO Member States have agreed on the feasibility of the implementation of RVSM on a global basis.

8.1 AFI RVSM Cost/Benefit Study

The main benefits arising from the implementation of RVSM in AFI airspace is a significant en-route airspace capacity increase. However, a cost/benefit study for RVSM should be completed for budget purposes. This analysis must take into account:

- ATC capacity enhancements;
- costs for aircraft altimetry upgrades;
- costs for ATM systems upgrades;
- costs for height-monitoring systems and operation;
- fuel efficiency gains, and
- costs of delaying implementation.

8.2 Capacity Requirement

The primary justification for the implementation of RVSM in the AFI airspace is the requirement to provide additional airspace capacity to meet the ever-rising number of aircraft movements. Of the various measures under consideration, the implementation of RVSM is considered to be, in the short term, the most cost-effective means of meeting this need through the provision of six additional flight levels for use in the highly congested airspace from FL 290 to FL 410 inclusive.

8.3 Stakeholder Cost Forecasts and Resource Requirements

The combined cost forecast for RVSM should be determined by means of a cost analysis. It is the responsibility of stakeholders to identify and gain approval for their own budget and resource requirements.

9. CONCLUSION

APIRG has endorsed the objectives of capacity and potential economy benefits associated with future implementation of a 1 000 ft reduced vertical separation minimum in the AFI Region and, therefore, concluded that such implementation planning should be treated as a priority item. It is recognized that a number of complex issues need to be addressed, including meteorological and topographical considerations, aircraft equipment, and air traffic control questions.

A National RVSM program for implementation in the earliest possible time-frame should be actively pursued, with implementation planning being carried out by the State and the ARPO. The RVSM Program will be fully coordinated for the entire area of future application, and will take full account of the work carried out by the Review of the General Concept of Separation Panel (RGCSP), the North Atlantic Systems Planning Group (NAT SPG), EUROCONTROL and other RVSM implementation plans of other ICAO Regions.

APPENDIX A

DRAFT NATIONAL RVSM IMPLEMENTATION SCHEDULE														
	2004												2005	
DELIVERABLE	MONTHS												M	
	J	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
PROGRAM MANAGEMENT														
RVSM Committee														
RVSM Master Plan														
RVSM Program Plan														
RVSM Promotion														
AIRCRAFT OPS & AIRWORTHINESS														
Aircraft System														
RVSM Approval														
Monitoring Policy														
Monitoring System														
Monitor Organisation														
Monitor System Ops														
AIR TRAFFIC MANAGEMENT														
Airspace														
ATC Procedures														
ATS Provider Support														
ATC Training														
Flight Planning														
ATFM														
ATS Systems														
Military Aviation														
ATS Provider Schedule														
Legislation														
OPS Data Collection														
Post-Implementation														
RVSM OPS Performance Review														
SAFETY ASSURANCE														
Safety Policy														
Pre-Implementation														
Post-Implementation														
HEIGHT MONITORING														
RVSM Aircraft Database														
Height Deviation Reports														
Readiness Assessment														

APPENDIX B

DRAFT NATIONAL RVSM PROGRAM DELIVERABLES			
	AIM	**DESCRIPTION**	**OBJECTIVE**
Sub-Program I - Program Management			
1	Establish National RVSM Implementation Committee	Define tasks for RVSM Implementation Committee and set-up facilities	Provide an Office to support RVSM Implementation
2	Develop RVSM Master Plan	Develop, in consultation with relevant Stakeholders, a RVSM Master Plan with realistic time scales	RVSM Master Plan, endorsed by all Stakeholders and given commitment by State
3	Program Management Activities	Develop an internal National Program Management Plan. Develop Program Management processes to enable effective and proactive management of the RVSM Program. Manage the RVSM Program throughout the required period and provide guidance/informative progress/status reports to Stakeholders. Give progress/status reports to AFI RVSM Program Office (ARPO).	National RVSM Program Management Plan. Program Management Process. Templates for progress monitoring. Progress/ status reports.
4	RVSM Promotion awareness activities undertaken by each State.	Establish information methods and links with all RVSM affected Stakeholders in order to provide support to the RVSM Program via advance information and collaborative actions. Increasing the levels of awareness throughout the industry and within each State will reduce risk of the program failing to attain objectives	Develop, deliver and coordinate an awareness program through actions, products and packages supporting RVSM milestones
Sub-Program II – Aircraft Operations and Airworthiness This Phase will ensure technical, operational and regulatory means will be available for airspace users and States to enable RVSM approvals. Any sub-programs must also assist and monitor the approval process. Aircraft Height Keeping accuracy will be verified through operation of a height-monitoring infrastructure. The monitoring system must provide technical data to confirm that safety objectives are met.			
5	Aircraft System Development	Prepare the necessary regulatory and guidance material. Establish a database of affected aircraft to ensure that all affected aircraft are suitably prepared for RVSM. Establish contact with operators to ensure they undertake the necessary actions for timely RVSM readiness.	Necessary regulatory material is issued to enable Operators to complete necessary modifications. The issue of reports to ARPO confirming ability to modify aircraft and to meet required target dates.
6	RVSM Approval Achievement	Ensuring that all actions are taken to ensure operators can achieve approval for RVSM. This includes establishing contact with relevant stakeholders, preparing the necessary notification material and the monitoring of progress of operators towards meeting the RVSM requirements	Operators ready for RVSM. Issue of periodic reports on the state of preparation of operators
7	Monitor Policy and System Architecture	ARPO to establish agreed means by which the monitoring policy is attained. Define the roles of all stakeholders for monitoring purposes. Define management criteria for GMU. Define monitoring system organisation.	All specifications and contracts in place to enable monitoring system development and operation.
8	Monitor System Development	Development and installation of identified number of GMUs.	Monitoring equipment (GMU) developed and available.
9	Monitor Organisation Development	RMA to manage identified GMUs. Construct required Operational Data management system.	Operation Ready Monitoring System.
10	Monitor System Operation	Monitoring system Application to obtain ASE data. Analysis of performance and dispatch of data to sub programs for further analysis. Follow-up action for aircraft, which appears not to be meet MASPS.	Obtain Technical data for consideration in Safety Assessment
11	Post RVSM Implementation Technical Enhancements	Follow-up monitoring after RVSM implementation to provide observations of performance together with the analysis of causes for any degradation of performance. This process will involve the follow-up of any anomalies, the notification of common causes for any problems observed and recommendation for enhancements	Performance reports and recommendations for appropriate system enhancements.

	AIM	DESCRIPTION	OBJECTIVE
Sub-Program III - ATM Preparation This Phase must ensure ATS service provider units are well prepared and ready for RVSM Implementation at the agreed date. Sub-Programs to identity tasks, which should allow States to make airspace changes, introduce RVSM Procedures, modify ATC systems, provide ATC Training and resolve legal issues.			
12	Airspace Structure	Assessment of RVSM on Transition/Non-Transition airspace simulation studies to validate airspace structure and any sectorisation changes. Develop ATS Route network improvements and sectorisation changes.	Provide assessment report for all ACCs in RVSM area. Complete RVSM simulation reports. Provide agreed proposals for ATS Route Network changes. Provide agreed plans for appropriate sectorisation changes.
13	ATC Procedures	Develop ATM Procedures for RVSM implementation.	Develop National RVSM ATC Manual.
14	ATS Providers Support	Provide support for site-specific implementation of RVSM ATS Procedures	Develop Site-specific ATS Procedures, as required
15	ATC Training	Provide RVSM ATC training syllabus - transition and non-transition areas. RVSM training for ATC Instructors. All controllers prepared for RVSM	Develop ATC training syllabus. Train ATC Instructors. Define National training programs. Train ATCs for RVSM Operations.
16	Flight Planning IFPS	Provide software and procedures in IFPS to ensure the correct handling and distribution of FPLs in respect of RVSM requirements	Develop Software and Procedures to fulfil FPL requirements.
17	RVSM impact on ATFM (where applicable)	Provide software and procedures for CFMU systems, to ensure the correct sector loading indications and flight handling for ATFM purposes	Develop Software and procedures to fulfil the requirement
18	ATS System Modification	Identify required ATS system modifications to meet operational requirements, amend existing interface specifications, and provide guidance for **HMI**, follow-up modifications to systems in all concerned ACCs.	Develop Operational Agreed Requirements for System Support and Interface Specifications (OLDI). Provide Support/advice during system modification.
19	Military Aviation Preparation	Identify military requirements related to RVSM implementation	Develop applicable Operational requirements
20	ATS Providers Countdown Schedule	Provide an aeronautical publication schedule and a countdown plan/schedule. Monitor readiness of States in executing the plan/schedule	Develop an Aeronautical Publication Schedule and a Countdown Plan/Schedule to implement RVSM.
21	Legislation	Create sub-group to identify legal issues and propose solutions	Sub-Group to provide legal Report and draft legal texts or guidelines to be implemented by States
22	Operational Data Collection for Safety Assurance	Establish process for collection and analysis of information concerning operational ATC and pilot errors - at minimum, operational incidents/ occurrences relevant to RVSM/height keeping.	Provide ATC/pilot operational error Report.
23	Post Implementation Operational Enhancements.	Assess RVSM operations and develop revised procedures, airspace structure and sectorisation to improve the utilisation of RVSM in RVSM airspace.	Publish Revised procedures of ATS Route Network improvements
24	RVSM Operational Performance Review	Assess ATM capacity before and after RVSM implementation and with specific reference to changes directly related to RVSM	Provide Assessment report on achieved operational benefits arising from RVSM.

AIM		DESCRIPTION	OBJECTIVE
Sub-Program IV - RSM Safety Assurance This Phase constitutes the Safety assessments necessary prior to implementation, just after implementation and at the end of the RVSM Program to ensure that the agreed safety objectives are met. Sub-Programs to include the development of an agreed RVSM Safety policy and identify need for States to prepare RVSM Safety Cases.			
25	Develop Agreed Safety Policy	Develop a National RVSM Safety Policy, in compliance with existing Safety Policies, in consultation relevant stakeholders	Provide a State RVSM Safety Policy
26	Pre-Implementation Safety Assessment	Identify required activities to ensure that safety objectives are met when RVSM is implemented.	Provide Go/No-go advice to ARPO from a safety point of view
27	Post Implementation Safety Assessment	Identify required activities to ensure that safety objectives are met when RVSM is implemented.	Report risk levels to ARPO, as basis for decision making to implement risk reducing measures

	AIM	TASK	OBJECTIVE
Sub-Program 5 - Height Monitoring The RMA is an APIRG authorised body to provide Safety Oversight services in connection with implementation and continued safe use of RVSM within designated airspace. States are required to approve aircraft for RVSM operations and provide safety oversight.			
28	RMA	RMA was established to monitor aircraft height and recommend aircraft for RVSM approval.	Provide safety oversight
29	RVSM Aircraft Database	CAA to establish Aircraft RVSM Approval database	Monitor operator RVSM compliance
30	Height Deviation	RMA to provide CAA with height deviation reports	Ensure safety oversight
31	Readiness Assessment	CAA to conduct safety readiness assessment	Meet RVSM Implementation Date

Appendix C

NATIONAL RVSM IMPLEMENTATION DELIVERABLES & RESPONSIBLE BODY				
Description	**Responsible Body**	**Start Date**	**Target Date**	**Status**
PROGRAM MANAGEMENT				
RVSM Committee	i.e. CAA			
RVSM Master Plan	Program Office			
RVSM Program Plan	Program Office			
RVSM Promotion	Program Office			
AIRCRAFT OPS & AIRWORTHINESS				
Aircraft System	i.e. CAA, Airline,			
RVSM Approval	i.e. CAA			
Monitoring Policy				
Monitoring System				
Monitor Organisation				
Monitor System Ops				
AIR TRAFFIC MANAGEMENT				
Airspace	i.e. ATS Provider			
ATC Procedures				
ATS Provider Support				
ATC Training				
Flight Planning				
ATFM				
ATS Systems				
Military Aviation				
ATS Provider Schedule				
Legislation				
OPS Data Collection				
Post-Implementation				
RVSM OPS Performance Review				
SAFETY ASSURANCE				
Safety Policy	i.e. CAA			
Pre-Implementation				
Post-Implementation				
HEIGHT MONITORING				
RVSM Aircraft Database	CAA			
Height Deviation Reports	RMA & CAA			
Readiness Assessment	CAA			

APPENDIX D

DRAFT NATIONAL RVSM PROGRAM